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BLACK SPOT OF ROSES

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The black spot disease causes severe injury to roses in most portions of the United States and Europe, and probably occurs wherever roses are grown. The disease is widespread in Florida, and for the most part is active throughout the entire year. Although the nature and extent of black spot injury varies according to the weather, location of the planting, type of growth and varieties involved, it often becomes very destructive. Varieties differ greatly in susceptibility to black spot, but under conditions favorable to the disease most of the better cut-flower sorts are seriously affected.

CAUSE

Black spot is caused by a parasitic fungus* and like most disease-causing organisms this fungus is microscopic in size. In its development on the rose leaf it manifests two stages, an active summer spore stage and an inactive winter spore stage. It is the summer spore stage which spreads the disease from leaf to leaf and from plant to plant during the growing season and causes defoliation. Temperatures permitting, this stage of the fungus persists throughout the entire year. The winter spore stage develops in dead, infected leaves which have fallen to the ground, and with the return of warm temperatures the spores are liberated and serve to reintroduce the disease.

SYMPTOMS

The disease is recognized by the presence of black spots on the leaves, and by premature yellowing and defoliation. The spots are more or less circular, black in color, have irregularly fringed margins, attain a size of one-half inch or more in diameter, and appear on the upper surface of the leaves as well as on the leaf petioles. The leaf tissue surrounding the spots usually turns yellow, although during moist weather following abundant infection the leaves of entire plants may drop before yellowing occurs.

CONTROL

To counteract black spot it is necessary to employ control measures with the establishment of the rose planting and adhere to them persistently throughout the season. If the planting is already established, control

* *Diplocarpon rosae* Wolf.

measures should be started when the plants are pruned in the winter or spring. In the latter case, the first step is the removal and burning of fallen leaves from beneath the plants, and the more frequently this is repeated the better. If a mulch is used beneath the plants, its character should be considered with this practice in mind. In making new plantings, avoid crowding, as good ventilation will enable the plants to dry quickly. If possible, water applications should be made so as to avoid wetting the foliage. Plants that are pruned to an open type of growth, properly spaced, and set away from walls or buildings are less subject to the disease. Finally, a suitable fungicide must be applied at frequent intervals.

The kind of fungicide and the method of applying it are of great importance. Both the copper and sulphur-containing fungicides have proved of value in combatting black spot, and both kinds may be obtained either in dust or liquid form. In addition to effectiveness of the fungicide against black spot, accessibility and cost, available equipment, ease of preparing and applying, adherence to foliage, severity of the disease, effect on the plants, and effectiveness against other diseases should be considered.

For dust application the choice lies between copper-lime dust and one of the high-grade sulphurs of 300-mesh fineness. Both kinds of dust may be readily obtained, are easy to apply and adhere well, and with proper equipment thorough applications may be made without serious discoloration of the foliage. Dusts are difficult to apply on windy days, but this objection may be overcome by making the applications early or late in the day. Copper-lime dust generally is inferior to the sulphur dusts for black spot control. However, for year-around application it is a safer material to use, as the sulphurs sometimes cause serious injury to the foliage on hot days.

The list of spray materials from which selection may be made is extensive, and includes both well-known and recently-introduced preparations. Those materials less apt to leave an unsightly residue on the plants include copper silicate, red copper oxide, "basic copper sulphate", ammoniacal copper carbonate, lime-sulphur 1:80, and the wettable sulphurs. Of the materials tested, either the copper silicate or "basic copper sulphate" sprays seem preferable for year-around use, since the sulphurs may cause injury to the foliage on hot days. It is advisable to use a wetting agent with these fungicides which do not already contain one, and instructions for their use usually are given on the container. Such materials as bordeaux mixture, basic copper chloride, and copper sulphate-soap-ammonia spray are particularly effective. However, since these deposit a very objectionable residue on the plants, their use should be limited mostly to the summer and early fall when the disease ordinarily becomes so destructive that flower production is unsatisfactory anyway.

Fungicide applications should be made at about weekly intervals during most of the year, frequent applications being particularly necessary during periods of rain, fog, or heavy dews. The fungicide may be applied at any time of the day, although there is less likelihood of foliage burning, if mid-portions of hot days are avoided. It makes little difference whether the foliage is dry or moist, but dry foliage permits better coverage with dusts. It is particularly important that newly-forming growth be coated promptly.